PINA

Core Curriculum
for the
Permaculture Design Course

Permaculture Institute of North America

August 2014

PINA's Permaculture Design Course Core Curriculum

This outline summarizes essential topics and learning goals for the standard 72-hour Permaculture Design Course, based on criteria described in the *Permaculture Handbook* by Bill Mollison and Andrew Jeeves, 1985.

Instructors present this curriculum using a variety of methodologies, and may include supplemental material appropriate to region and instructor, including integrated whole-systems design examples from temperate, tropical and arid environments.   Topics may be covered in any sequence.

Participants are assessed for certification based on full attendance of the 72-hour program, including completion and presentation of the group-based design project.

> *Learning Goals for Participants*
> *Students complete the course with a basic understanding of:*
> * *Permaculture ethics and principles, including sample strategies and techniques for realizing them in design*
> * *Reading landscapes, interpreting all elements and their relationships to each other*
> * *Applying permaculture principles to land and community development in small and large-scale designs*
> * *Methods and tools for adopting these practices in all aspects of their lives*

A. Core Curriculum Topics

1. Introduction to Permaculture
  • Evidence of the state of the world
  • Philosophy, history, and impact of current cultural values

> *Learning Goals*
> * *Understand how current cultural values drive the destruction of society and nature*
> * *Provide a relief valve to move the discussion toward positivism*

2. Ethics and Principles
  • Earth Care
    People Care
    Fair Share (distribution of surplus)
    Limits Aware (constraints to consumption and population)
    Positive attitudes and self-responsibility
  • Holmgren's 12 Principles and their correlation to Mollison's Principles

> *Learning Goals*
> * *Know the permaculture ethics and their applications in culture*
> * *Understand that values guide design decisions*
> * *Comprehensive understanding of ecological design principles and how to apply them across cultural domains*

3. The Local Ecosystem
- Observation skills
- Principles of ecology
- Reading the landscape

> **Learning Goals**
> - *Get to know the place where the design comes about*
> - *Describe the flow of energy through the system, the cycling of materials within it, and the feedback loops that integrate it*

4. Patterns and Pattern Application
- Visible patterns in nature: Form follows function
- Tools and methods for noticing patterns and interpreting significance: Flows, orders, indicators, anomalies, paradoxes, attractors
- Examples of applying pattern to design
- Edge strategies

> **Learning Goals**
> - *Recognize and analyze patterns found in the natural world and apply them to landscape design*

5. Climates, Biogeography and Microclimates
- The global climate system, natural history, and climate change
- Characteristics of temperate, tropical, humid and arid climates, and design strategies for each
- Assessment of current and changing climate and adaptations to it
- Biomes, genetic distribution, biodiversity
- Climate near the ground: Aspect, slope, vegetation, surfaces and structures
- Design of windbreaks

> **Learning Goals**
> - *Gain awareness of species and technologies appropriate for climatic conditions*
> - *Understand how permaculture design impacts climate on different scales*
> - *Implement strategies that lessen risk of climatic extremes.*

6. Design Methods and Process
- Whole systems thinking; access to both halves of the brain and multiple intelligences
- Observation and enhancing intuition
- Data gathering (including access to public information) and assessment; inventories
- Client interview; goal statements
- Pattern languages and articulating vision
- Analytical methods: Site analysis and patterning; sectors, zones, elevations, slope and orientation; needs-and-yields (niche analysis); limiting factors; design by exclusion
- Mapping concepts and elements; mapping with simple skills and tools using scales from homestead to broad-acre; contours, data overlay
- Conceptual design; bubble diagram
- Sequence and implementation; flow charts; budgets
- Graphical representation; presentation skills; importance of documentation
- Monitoring and feedback

> *Learning Goals*
> - *Understand the practice of design as a discipline*
> - *Evaluate ecological design frameworks and methods for suitable applications*
> - *Observe, analyze, and assess a site to determine resources and constraints*
> - *Draw zone and sector maps and flow diagrams for a site design*
> - *Apply whole systems thinking and problem-solving; integrate elements, principles, relationships, and emergent properties of dynamic systems*
> - *Demonstrate comprehension of the site design verbally and graphically*

7. The Home System
- Patterns and elements of domestic self-reliant economies
- Distribution of economic function by zone and sector analysis
- Transition from consumer to producer households

> *Learning Goals*
> - *Understand the pivotal role of household capacity in resisting economic predation*
> - *Design an example home system by placing buildings, vegetation, and infrastructure*

8. Water
- The hydrologic cycle
- Conservation, water's functions, matching quality to use
- Water harvesting and storage in built containers, in ponds, and in ground
- Tropical, arid, and temperate strategies

> *Learning Goals*
> - *Understand the water cycle and the importance of water*
> - *Determine water flow in landscape and through domestic systems*
> - *Apply conservation measures to one's own life*

9. Earthworks
- Keyline design, micro-catchments, gabions, and check dams
- Use of levelling instruments and construction of swales
- Design and construction of earthen dams and ponds

> *Learning Goals*
> - *How to channel and store runoff by proper location and building of these elements*

10. Soils
- Soil biology and function in the ecosystem
- Soil texture, structure, classification, and testing
- Fertility management and soil repair

> **Learning Goals**
>   • *Read the soil of place and determine what it needs*
>   • *Ways to build healthy soil in any environment, including sheet mulch and compost*

11. Trees, Forests, Plants, and Cultivated Ecologies
   • Architecture, growth, and function of trees; placement and role of forests
   • Guilds and polyculture
   • Agroforestry, tree crops, multifunctional hedgerows, and orchard design
   • Plant selection and identification; life strategies, succession, and niches
   • Plant physiology and propagation
   • Design and establishment of vegetable gardens and edible landscapes
   • Season extension: Cloches, hoop houses, greenhouses, and other techniques
   • Integrated Pest Management
   • Seed saving and exchange

> **Learning Goals**
>   • *Understand forest succession, plant layers, and diversity within the forest*
>   • *Basic botany; identify types of plants and understand their roles*
>   • *Propagate four different types of plants*
>   • *Understand polycultures and the niches of plants*
>   • *Design a small food garden*
>   • *Knowledge of decision-making tools to work with pest challenges*

12. Animals
   • Designs that integrate plants and animals (alley cropping, rotational grazing, etc.)
   • Roles and habitats of small and large livestock
   • General husbandry: Food, hygiene, health care, protection, reproduction
   • Breed selections: Needs, yields, and characteristics
   • Land management

> **Learning Goals**
>   • *A basic understanding of care for diverse species of animals*
>   • *Awareness of animal impacts on the land and how to use them in a positive manner*
>   • *Know how to attract beneficial wildlife*

13. Aquaculture
   • Aquatic ecology: Trophic food web, limiting factors, and design criteria
   • Chinampas and other cultivated aquatic ecosystems
   • Aquaponics; species choices

> **Learning Goals**
>   • *Apprehend methods of diversifying water bodies on large and small scales*

14. The Built Environment
   • Siting of structures relative to climatic conditions, elevation, functions
   • Building design for comfort and function; appropriate materials; passive solar heating
   • Natural building vs. Green building; energy sources and standards
   • Energy uses, efficiency, and retrofits
   • Examples of different natural building techniques

> **Learning Goals**
>   • Address design for function: Energy conservation, shape and placement, materials, utility
>   elements and aesthetics

15. Waste and Bioremediation
   • Conservation and recycling of materials in households and society
   • Reclamation and re-use of greywater, blackwater, and soil and water on toxic sites
   • Hygienic capture, treatment, and cycling of human waste
   • Closed-loop manufacturing strategies (cradle to cradle)

> **Learning Goals**
>   • Guidelines to closing soil nutrient loops
>   • Assess personal practices regarding material use

16. Appropriate Technology
   • Holmgren's *Future Scenarios*: Relation of energy and technology to social structure
   • Low, intermediate, and high technologies
   • Examples, sources, and importance of appropriate tools
   • Energy sources and energy-conserving technologies
   • Renewable energy generation: Solar, wind, hydro

> **Learning Goals**
>   • What makes technology appropriate, and how to use energy efficiently on a site

17. Design for Catastrophe
   • Types of disaster, impacts, risks, planning, and responses
   • Analysis, behavior, and mitigation

> **Learning Goals**
>   • Be able to identify and prevent potential site problems through good design
>   • Increase resilience by knowing how to prepare for emergencies and disasters

18. Urban Permaculture
   • Patterns in human settlement; flows and orders
   • Constraints and opportunities in the urban context
   • Local food security, energy alternatives and building techniques, waste cycling

> *Learning Goals*
>   • *Be able to apply appropriate permaculture strategies in urban areas*

19. Broadscale Landscape Design
  • Development of Zones 3, 4, and 5
  • Practical procedures in property design
  • Strategies for farmers
  • Wildlife habitat

> *Learning Goals*
>   • *Understand imperatives and challenges of rural regeneration, income from acres*

20. Design for Invisible Structures
  • Types and importance of invisible structures: Hierarchies and networks, information flow
  • Strategies in community organizing and development
  • Issues of land use and building regulation, law vs. practice, attitude, and mores

> *Learning Goals*
>   • *Evaluate health and conviviality of legal and social environments*

21. Economic Systems
  • Household and community economies: Natural, human, and social capital
  • Real wealth: Degenerative, generative, and regenerative assets
  • Formal and informal complementary currencies; community lending and banking
  • Right livelihood and making a living

> *Learning Goals*
>   • *Awareness of examples of non-formal and formal economics*
>   • *Familiarity with sustainability-related value systems such as triple bottom line*

22. Access to Land
  • Trusts: Private and public for housing, farming, forestry
  • Group purchase: Co-housing, intentional community, urban community block
  • Legal forms of tenure: LLC vs. partnership
  • Use of commons, landless movements and strategies

> *Learning Goals*
>   • *Revisit the ethics of land care*
>   • *Understand some of the benefits and challenges in living in intentional communities*
>   • *Know how and where to look for land to grow food*

23. Ecovillage and Neighborhood Design
  • Working at the political / personal edge to achieve effective land stewardship
  • Use of Pc principles: Design, education, planning social and invisible structures
  • Infrastructure development and financing

• Defined governance and ownership structure; collective management and adaptation
• Develop and promote a local, ecological, and economic base
• Shared responsibility and predictable challenges
• Intergenerational connections and responsibility; community glue

> **Learning Goals**
>   • *Know how to design physical and invisible structures that encourage and support healthy community interaction*

24. Permaculture Scene
• Local, regional, and global networks and organizations: History, mores, needs

> **Learning Goals**
>   • *The local, regional, and global Permaculture networks and how to join them*

25. Design Projects and Presentations
• Visioning, action learning, advocacy
• Group intelligence, cooperation, project management

> **Learning Goals**
>   • *Gain insight to the value of collaboration and multiple voices for holistic design*

26. Passion Show / Talent • Untalent Show / Cabaret / Party

> **Learning Goals**
>   • *Know how to unleash a group's collective genius to create entertainment and culture*
>   • *Gain experience in presenting to a group*
>   • *Get to know and collaborate with coursemates in a playful context*

B. Optional Curriculum Topics
Hands-on Interactive Exercises
• Short, interactive design exercises
• Mapping of Zone 1 by triangulation
• Constructing an A-frame level, laying out a contour, then digging a swale
• Designing a sand or dirt pile
• Keyline exercise on a large dirt pile
• Building a pond
• Designing and building a rainwater tank
• Installing irrigation
• Analyzing soil test jars and soil characteristics
• Making a compost pile
• Sheet mulching
• Planting a cover crop
• Understanding botany and identifying plants

- Prepping and planting a garden bed
- Planting a guild
- Planting trees, shrubs or herbs
- Mixing soil for seed flats, starting bedding plants
- Pruning, grafting and other methods of plant propagatiion
- Preserving food by lactic fermentation, drying, etc.
- Plastering, cob and other natural building techniques
- Designing a business

Additional Topics
- Nature connection: Primitive skills tracking, bird language
- Biochar
- Medicinal herbs
- Mushroom cultivation
- Beekeeping
- Permaculture design for wild lands (Zone 5)
- Pantry design and dietary considerations
- Inner permaculture
- Group process and facilitation
- Community decision-making
- Design charrette using Open Space or World Café process